



In a Speck of Soil

Introduction

In the book *Jo MacDonald Had a Garden*, author Mary Quattlebaum introduces children to the plants and creatures in a garden and shows how to create gardens that benefit both people and wildlife. In this activity, children use observation and several scientific tools to examine garden soil.

Materials Needed

- ◆ Small bucket of soil from garden
- ◆ Scientific notebook
- ◆ Pencils
- ◆ Magnifying glass
- ◆ Microscope
- ◆ Slide and slide cover

Key Concepts

- ◆ Scientific resources combined with observations.
- ◆ Conduct a simple systematic observation or investigation.
- ◆ Use simple instruments such as magnifier and microscope to gather data and extend the senses.
- ◆ Communicate investigations that might be drawn or spoken as well as written.
- ◆ Tools help scientists make better observations, measurements, and equipment for investigations.
- ◆ Soils have different properties and abilities to support plants.

Procedure

1. Tell children that they are scientists and will be making careful observations of soil using three types of scientific tools (eye, magnifying glass, and microscope).
2. Ask them to draw one big circle on each page of scientific notebook.
3. Give each child small handful of soil. Explain that soil is made largely of small rocks and decomposing plants and animals. Have children examine soil with hands and eyes. This is Observation 1. Ask what they feel/see or "observe" (any tiny rocks or bits of old leaves, for example); have them list and then draw their observations inside the first circle in notebook. The eye is usually the scientist's first tool.
4. Have children observe a bit of their soil with a magnifying glass and draw what they see inside the second circle in notebook. This is Observation 2.
5. Place a bit of soil on slide with cover slip. Have children observe with microscope and draw what they see inside the third circle of notebook. This is Observation 3.
6. Have children compare their different observations. What are similarities and differences between the three drawings?
7. Explain that Jo MacDonald was able to see many garden plants and creatures with her naked eye. Some creatures are so tiny, though, that you can see them only with a microscope—but they are very important. Some tiny bacteria act to decompose or break down dead plants and animals; others help plants to use the nutrients in the soil.

Nature Connections

- ◆ Invite children to examine dirt collected from a spot where nothing is growing by repeating steps 2-6 in procedures above. Have them compare their observations/drawings of soil and dirt. What are similarities? Differences?
- ◆ Have children examine a bit of soil to which a drop of bleach or other chemical has been added. As teacher, repeat step 5 in procedures above and do not let children handle/feel the polluted soil. Have them compare their observations/drawings of soil and soil with bleach. Discuss with children: How might pollutants and chemicals affect the microorganisms that enrich the soil? What might be the effect upon food grown in polluted soil? The effect upon creatures that then eat that food?

Additional Resources

Soil Composition

http://www.soil-net.com/cms_test/ks2/topic5/topic5_factsheet.pdf

Microscopic Soil Bacteria

http://www.youtube.com/watch?v=7sB_cTCyEA0

A Handful of Dirt by Raymond Bial Walker.

